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Federal Domestic Plant Quarantines

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Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

ABOUT THIS REPORT . . .

Federal domestic plant quarantines protect our food, feed, fiber, and forests from the full destructive potential of plant diseases, insects, and other pests. Without these quarantines, fruits, vegetables, and many other materials carrying such destructive agents would move in commerce and jeopardize our agricultural abundance, and greatly multiply the costs of production.

The pests and diseases in question are aliens. How they got into this country cannot always be explained, but how they entered is less important than the fact that they are here. They are often highly destructive because their natural enemies were not brought here with them.

Plant pest control officials depend on the understanding and cooperation of many organizations and individuals to help prevent the spread of dangerous pests and plant diseases. This report may contribute to further understanding and cooperation by explaining briefly the plant pest and disease problem and the laws and regulations that empower plant quarantines, and by describing the Federal quarantines currently in force within the United States.

This report is NOT a substitute for domestic plant quarantine regulations. Specific questions about the regulations should be referred to your plant pest control official.

Information in this report was furnished by the Plant Pest Control Division and the Plant Quarantine Division of the Agricultural Research Service.

FEDERAL DOMESTIC PLANT QUARANTINES

Certain plant diseases, insects, and other destructive plant pests cost the people of this country more than \$7 billion a year due to their damage and money spent to control them. Most of this loss is chargeable to alien pests and diseases, many of which came to this country before our Federal quarantine laws were enacted.

The European corn borer, for example, probably got into this country in 1910 on imported broomcorn. It now infests too vast an area for an effective quarantine effort. Chestnut blight, a fungus disease from Asia, has killed almost all of our native chestnut trees.

The Plant Quarantine Division (PQ) of USDA's Agricultural Research Service is our first line of defense against alien pests and diseases, many of which are potentially as destructive as the European corn borer or chestnut blight. PQ regulates the importation of plants, plant products, and other objects or materials that might harbor pests and pathogens. During the past several years, inspectors have intercepted an average of one of these destructive agents every 16 minutes around the clock.

Despite this vigilance, however, alien pests and diseases do slip by our guards. Some pests that are initially successful in entering the U.S. undoubtedly encounter adverse environments and perish almost immediately. The ones that find their way into favorable environments, however, may become established and quickly build up damaging populations.

Federal domestic plant quarantines are established to prevent introduced insects and other destructive pests and diseases from spreading from infested areas. The Plant Pest Control Division (PPC) of the Agricultural Research Service, acting for the Secretary of Agriculture and for the American people, has the primary responsibility to see that these pests and diseases do not spread interstate beyond the quarantined areas. This is accomplished by invoking quarantines that implement plant pest laws enacted by Congress.

When discovered, most of these destructive agents are not widely distributed but may infest or threaten more than one State. Domestic plant quarantines, therefore, are effective in such cases because the Federal Government may regulate the interstate movement of potential pest-carrying materials and thereby protect uninfested areas.

FEDERAL-STATE RELATIONSHIPS

Federal laws and quarantines regulate interstate and foreign commerce to prevent the movement of injurious plant diseases and pests. Individual States, districts, commonwealths, and territories, however, have authority to enact plant quarantines and regulations to protect themselves against such menaces not covered by Federal quarantines. They can intercept and inspect potential pest-carrying materials. State and Federal plant pest control officials cooperate, often acting for each other, in survey and detection, in enforcement of both Federal and State quarantines, and in eradication.

Some of the Federal laws that empower foreign and domestic plant quarantines are the Plant Quarantine Act of 1912 as amended, the Terminal Inspection Act of 1915, the Department of Agriculture Organic Act of 1944 as amended, and the Federal Plant Pest Act of 1957 (see p. 10).

WHEN NEW PESTS ARE DISCOVERED

As soon as destructive plant pests are found in new areas, Federal and State officials determine the extent of the infestations and the possible hazard. Then the officials call a public hearing to get the public's views. If quarantines are deemed to be in the public interest, the necessary notices and regulations are issued. These specify the articles that might spread the pest and outline ways that the articles can be moved. Federal certificates attached to articles for interstate shipment allow the materials to move freely to any destination. Thus, interstate shippers of such articles do not have to comply with a myriad of State regulations. When people become aware of the advantages of the quarantines, they usually cooperate willingly.

QUARANTINE REGULATIONS

Quarantine regulations have the force and effect of law. Only those restrictions or requirements needed to prevent spread of a pest are imposed. For example, although entire States may be placed under quarantine, the restrictions on commerce are limited to areas considered infested. These are called regulated areas.

Regulated Areas

Regulated areas may be entire States or parts of States. These areas comprise actual infestations and a surrounding safety border. An area remains under regulation until the Director of the Plant Pest Control Division determines that the pest is no longer a menace. As necessary, regulated areas are redefined to reflect changes in the extent of infestations. Such changes are considered carefully with the States concerned before any action is taken.

Regulated Articles

Regulated articles are listed and described in the quarantine. They include commodities, equipment, and transportation facilities known to be pest carriers, or other items that might spread a pest. For example, they may include plants on which an adult insect feeds or soil that the insect may inhabit. Also included are objects or articles upon which an insect may lay its eggs, conveyances that might harbor the pest, alternate hosts for plant diseases, and susceptible plants themselves.

Articles listed in the quarantine regulations cannot be moved lawfully from regulated areas into or through other specified areas except in the manner and method described in the regulations. Certificates or permits (see below) are used to indicate that the regulated articles are eligible for interstate movement. Persons intending to move regulated articles should apply as far in advance as possible to have them inspected. The articles should be protected from infestation and are to be assembled in a manner to facilitate inspection.

Certificates

Quarantine regulations authorize an inspector to issue certificates when: (1) In his judgment the articles have not been exposed to infestation; (2) he has examined the articles and found them free of infestation; (3) he has supervised approved treatment of the articles to destroy infestations; or (4) the articles were grown, produced, manufactured, stored, or handled in such a way that in his judgment no infestations would be transmitted by them. Inspectors may withdraw or cancel certificates and may refuse to issue further certificates whenever it is determined their continued use might allow a pest to be spread.

Permits

Quarantines provide that under certain conditions an inspector may allow regulated articles that have not been certified to be moved under permit to specified destinations for limited handling, utilization, processing, or treatment.

The Director of the PPC or PQ Division may issue a permit to allow the movement of living pests for scientific study if adequate safeguards are taken to prevent its dissemination.

TREATMENT OF REGULATED ARTICLES

To be eligible for movement, infested regulated articles must be treated to eliminate the hazard of spreading a pest. Any one of numerous approved treatments may be used by shippers when applied under the supervision of inspectors. Such treatments must (1) destroy the pest, (2) not damage the product, and (3) leave no dangerous residue. Inspectors supervising these treatments are technically and scientifically trained. Following are examples of such treatments which, when properly applied, make regulated articles eligible for certification.

Fumigation

Fumigation is widely used to kill numerous pests such as (1) pink bollworms in cotton products and equipment; (2) fruit flies in citrus and other fruit; (3) larvae of Japanese beetle, European chafer, or white-fringed beetle in soil; (4) soybean cyst nematode on equipment; and (5) khapra beetles in warehouses, mills, grain storages, trucks, and railroad cars.

Cleaning

Farm and industrial equipment and tools may be freed of pests by cleaning. For example, either water, air, or steam under pressure are used to remove soil which may contain such pests as witchweed seed, cysts of the golden and soybean nematode, and larvae of the white-fringed beetle, Japanese beetle, or European chafer.

Soil Treatment

Insecticides are applied to soil in nurseries to kill pests such as the Japanese beetle, white-fringed beetle, and European chafer. At airports, rail sidings, and other hazardous transportation and industrial sites, soil is treated to destroy a number of plant pests. Such treatments eliminate or reduce the possibility the insects might be transported long distances.

Treatment of Foliage

Foliage can be sprayed to control such pests as European chafer, gypsy moth, Japanese beetle, and white-fringed beetle. These treatments when applied at loading and storage areas or in the environs of nurseries reduce the danger of spread.

Other Treatments or Procedures

Several other treatments are also used to certify regulated articles. Soil may be screened to remove larvae of the white-fringed beetle, European chafer, and the Japanese beetle. High density compression will kill pink bollworm larvae in baled cotton lint and linters. Small plants may be dipped in approved chemical compounds to destroy soil-inhabiting insects.

While many articles must be treated before they may be certified for interstate movement, certain procedures of harvesting, handling, and storing may also make products safe. For example, grain which has been in storage for 90 days after harvest in the cereal leaf beetle area does not harbor live leaf beetles and is therefore safe to move. Watermelons which have had normal cleaning for market may move freely from soybean cyst nematode areas.

INSPECTION IN TRANSIT

Inspectors of the Plant Quarantine Division regularly check regulated articles at 13 major gateways through which parcel post, express, and freight are routed interstate. These inspections have aided significantly in the enforcement of domestic plant quarantines. Inspectors examine approximately one-half million shipments a year at these gateways. Of this number, approximately 500 are annually found to be moving interstate in violation of Federal domestic or State plant quarantines.

Inspections are made of such noncertified articles and, if found free of plant pests, they may be certified and allowed to proceed. The shipper and the carrier, however, are notified of the violation and other shipments from the same source receive special attention.

When noncertified articles constitute a hazard, they are destroyed or returned to the shipper.

INSPECTION AT TERMINALS

The Terminal Inspection Act of 1915 aids in preventing spread of harmful pests. Lists of plants under State quarantines are submitted by the States to the Secretary of Agriculture for approval. When approved and forwarded to the Postmaster General, plants listed are accepted by the Post Office Department for inspection at destination by State inspectors. Plants found free of pests are forwarded, while those infested are treated, destroyed, or returned to sender.

THE QUARANTINES

The USDA has enacted 24 domestic plant quarantines since passage of the Plant Quarantine Act. There are 13 still in force. The others were revoked for various reasons—for example, the pest in question was eradicated, certain problems could be solved more readily by State action, or the pest's spread could not be checked by quarantine.

The regulated articles specified in each quarantine, when considered infested, may be moved to any destination if treated by approved procedures under the direction of an inspector (see p. 3). These procedures, developed through research studies, eliminate pest risk without injury to the articles. A brief explanation of most of the Federal quarantines now in effect follows. Specific questions about them or the approved treatments should be referred to your plant pest control official.

Black Stem Rust

Black stem rust, caused by a fungus, *Puccinia graminis*, has been in this country since colonial days. It attacks cereal grains and spreads by means of airborne spores.

The quarantine regulates the movement of rust-susceptible barberry and mahonia plants—the alternate hosts of black stem rust. Planting them in areas where they have been removed is prohibited.

Fruit and seed of rust-susceptible barberry and mahonia plants cannot be moved into States where eradication is in progress. Eighty-seven species and varieties of barberry and mahonia are now regulated as rust-resistant and can be moved interstate. This program through the control of rust-susceptible alternate hosts of the disease protects the important grain-producing areas of this country.

European Chafer

The European chafer, *Amphimallon majalis* (Razoumowsky), was first discovered in this country in 1940 in Wayne County, N.Y. It has since been found in other areas in western New York, in the New Jersey-New York City harbor area, and at isolated points in Pennsylvania, Connecticut, and West Virginia. The latter infestation was eradicated.

Quarantine regulations affect all infested areas and include such items as nursery stock, sand, soil, and gravel.

The larvae live in the soil and feed on the roots of plants. Heavy infestations seriously damage permanent pastures or plantings of winter grains. Sometimes root damage to sod is so extensive that it can be rolled from the soil surface. The chafer's destruction of hillside pastures in this manner exposes them to erosion. It is believed that this pest could survive throughout the humid areas of the United States and in irrigated areas of the arid West.

Gypsy Moth

A resident of Medford, Mass., brought eggs of the gypsy moth, *Porteretria dispar* (L.), to this country from France about 1869. Some larvae escaped from the laboratory. From this small beginning, the gypsy moth spread to become a full-fledged pest and the subject of our first domestic plant quarantine.

The gypsy moth is one of the most destructive pests attacking our forest and shade trees. The larvae feed on leaves and are capable of completely defoliating trees. Hardwoods are often severely damaged and some evergreens do not survive.

The northeastern part of the country is under Federal quarantine for the gypsy moth. Michigan, New Jersey, Ohio, and Pennsylvania also have State regulations to curb the spread of light, isolated infestations that occur outside of Federally regu-

lated areas with those States. For many years the gypsy moth has been successfully contained within the northeastern U.S. The pest was spread artificially to Ohio and an infestation was found at Lansing, Mich. It was eradicated from these areas. This insect is a potential pest to more than 100 million acres of hardwood forests extending westward to Missouri and Oklahoma.

The shipment of products infested with egg masses is the most likely means of spreading the pest long distances. Some regulated articles are timber products, plants having persistent woody stems, and stone and quarry products. These products as well as Christmas trees and other decorative greens have to be inspected before they can enter trade channels.

Imported Fire Ant

The imported fire ant, *Solenopsis saevissima richteri* Forel, is believed to have entered this country before 1920 from South America through the port of Mobile, Ala. In 1930, it was recognized as a species distinct from two others which are native and abundant in the Southern States.

By early 1950, the pest had spread into many of the Southeastern States. As a result of public demand, Federal funds to control the pest were made available in 1957.

The imported fire ant feeds on and destroys young, succulent, vegetables and other crops. It attacks and injures young, unprotected, animals and birds. Its sting is painful to humans and may be serious if the victim is allergic to the ant's venom. The ant's hard-crusted mounds built in pastures, meadows, and other open sunny fields, interfere with farming operations.

Areas under regulation now include Southeastern and South Central States. The imported fire ant can probably adapt itself to many other sections of the United States.

The pest spreads when queen ants leave old colonies to establish new ones. It may also be spread by movement of infested soil.

Regulated articles include soil, nursery stock, and timber products.

Japanese Beetle

The Japanese beetle, *Popillia japonica* Newm., was first reported in the United States at Riverton, N. J., in 1916. It was probably brought into this country some time earlier in plants imported from Japan.

The Japanese beetle is difficult to control and it spreads aggressively. It is very destructive. The adult feeds on various fruits and skeletonizes the leaves of grapes, peaches, soybeans, roses, and hundreds of other agricultural and decorative plants. The larvae feed on and damage the turf in pastures, lawns, and golf courses.

In 1918, the USDA and New Jersey initiated a program to exterminate the pest. The infestation, however, was too well established and could not be eradicated with the control measures available at that time.

Quarantine regulations apply to soil, nursery stock, grass sod, plant crowns or roots, and bulbs. Aircraft and other vehicles, or anything else that might carry

the pest, are also regulated. Nurserymen apply approved dosages of residual insecticides to nursery soils or treat the stock individually before it is shipped from the regulated area.

Most States east of the Mississippi River are totally or partially regulated under the provisions of this quarantine.

On June 7, 1961, an isolated infestation of the Japanese beetle was found at Sacramento, Calif. This infestation has apparently been eradicated by Federal and State action, but the area is being kept under surveillance.

Mexican Fruit Fly

The Mexican fruit fly, *Anastrepha ludens* (Loew), is native to Mexico where it infests much of the citrus area. The female fly deposits her eggs beneath the skin of the fruit and larvae make the fruit unfit for human consumption.

Each fall and winter the flies infest citrus in the lower Rio Grande Valley of Texas. Even though the fly has not been known to survive year-round in Texas, it is nonetheless a threat to other areas of the United States where citrus, peaches, and other hosts are produced.

The Federal quarantine regulates the movement of fruit from the Rio Grande Valley to susceptible host fruit-producing areas. Fruit is fumigated as necessary to destroy the fly larvae.

The quarantine has successfully prevented the spread of the Mexican fruit fly from the Rio Grande Valley.

Pink Bollworm

The pink bollworm, *Pectinophora gossypiella* (Saud.), is said to be generally established in every country in the world where cotton is grown. It is one of the world's most destructive pests of cotton and okra.

It was first found in the United States in 1917 at Hearne, Tex. Although the pest has spread from that area, regulatory programs are protecting areas where two-thirds of all U.S. cotton is produced.

Areas under regulation are located in the south-central and southwestern parts of this country. Regulated articles include cotton plants and parts, machinery associated with the handling or processing of cotton, and okra.

In 1932, the pink bollworm was found infesting wild and ornamental cotton in southern Florida. From this area, it spread to domestic cotton in northern Florida and southern Georgia where it was eradicated. In southern Florida, wild and ornamental cotton is being destroyed to keep the pest from again infesting commercial cotton.

Soybean Cyst Nematode

The soybean cyst nematode, *Heterodera glycines* Ichinohe, a serious pest of soybeans in Asia, was first found in the United States in New Hanover County, North Carolina, in 1954. It was soon reported in other States.

The soybean cyst nematode, an unsegmented worm about 1/50 of an inch in length, damages plants by feeding on their roots. Typical foliage symptoms—yellowing and stunting—do not always appear if the plants are in heavy fertile soil and have ample moisture.

Regulated areas now include portions of North Carolina and Virginia as well as areas near the Mississippi River in Arkansas, Illinois, Kentucky, Mississippi, Missouri, and Tennessee.

Among the regulated articles are soil, nursery stock, certain farm crops, and farm and construction equipment.

Keeping the soybean cyst nematode from spreading is particularly important since no satisfactory chemical treatment is available to control it. This nematode is a potential pest of soybeans wherever they are produced in this country.

White-fringed Beetle

The "white-fringed beetle" refers to species and races of beetles belonging to the genus *Graphognathus*. They are natives of South America and were first found in the United States in Okaloosa County, Florida, in 1936.

All adult white-fringed beetles are wingless females. The larvae live in the soil and do the most damage. It feeds on the roots of at least 385 different plants. Clover, corn, alfalfa, cotton, peanuts, potatoes, and other valuable crops may be damaged so severely that yields are reduced as much as 70 percent.

Although quarantine regulations apply only to infested areas in the Southeastern States, the pest could survive in that area south of a line drawn from New York City to southern Iowa. Regulated articles include plants, soil, various farm crops, machinery, and industrial supplies.

The quarantine against the white-fringed beetle has been effective. Less than 1 percent of the area in the 10 Southeastern States is known to be infested.

White-Pine Blister Rust

Importations of nursery stock probably brought white-pine blister rust, caused by *Cronartium ribicola*, into the United States in 1897. These importations continued until the Plant Quarantine Act became law in 1912.

The pest spreads by means of airborne spores. A tree may be infested for 3 years or longer without showing signs.

Today white-pine blister rust is present in many of the States of the continental United States. Quarantine regulations apply to the District of Columbia and to all States except Hawaii and Alaska. The regulations control the movement of five-leaved pines and wild or cultivated currant and gooseberry plants (the pest's alternate hosts) into areas having commercially important stands of susceptible pines.

The general aim of this program is the systematic protection of five-leaved pine stands by eliminating the alternate hosts of the rust.

White pines are among our most highly prized forest trees. About 35 years ago the outlook for their survival appeared very gloomy inasmuch as blister rust had reached practically all susceptible stands. As a result of the cooperative quarantine program, the pines are again flourishing over thousands of acres.

Witchweed

An exchange student from India recognized the pest witchweed, *Striga asiatica* (L.), in North Carolina while attending a plant disease clinic. Witchweed, a very destructive pest, is a parasitic plant that attacks corn, sorghum, sugarcane, and about 140 additional species of plants in the grass and sedge families.

Witchweed has been known in Asia, Africa, and Australia since 1790. In 1900 it was recognized as a serious parasite in South Africa. The find in North Carolina is the first on record in the Western Hemisphere. If allowed to spread it could become a pest wherever corn is grown.

Soon after the discovery, the U.S. Department of Agriculture joined with North and South Carolina to locate and eradicate infestations and prevent the pest from spreading. Regulated areas now include many counties in southeastern North Carolina and northeastern South Carolina.

A witchweed plant produces 50,000 to 500,000 almost microscopic seed. These lie dormant but viable in the soil for years until they are stimulated to germinate by the presence of host plants. Witchweed roots then penetrate the roots of the host plant depriving it of nutrients and water. Plants parasitized by witchweed, wilt severely and eventually turn brown and die. Gross symptoms resemble those of severe drought.

Because witchweed seed are so tiny, infinite care must be exercised to keep them from being carried out of infested areas. Regulated articles include soil, nursery stock, certain farm crops, and used farm and construction equipment.

THE KEY ROLE OF COOPERATION

Quarantine officials solicit the assistance of other agencies in the enforcement of regulations. Personnel of rail, truck, air, and other transportation facilities as well as employees of the Post Office Department cooperate by refusing to accept non-certified material. Prospective shippers are referred to plant inspectors to have articles properly certified for movement from regulated areas.

The Department of Defense assists by treating infested areas under their jurisdiction. They aid in the enforcement of regulations affecting the movement of their supplies, materials, and personnel.

Officials also seek the cooperation of garden clubs, civic groups, various farm organizations, as well as individuals. When properly informed they willingly extend their assistance in efforts to control and prevent further spread of destructive plant pests.

Compliance with quarantine regulations is solicited rather than relying on heavy-handed methods of enforcement. However, quarantine officials do not hesitate to resort to law in instances where cooperation is not forthcoming and to prosecute offenders when a violation appears to be willful or intentional.

QUARANTINE LAWS AND SOME OF THEIR PROVISIONS

The United States was one of the last major powers to enact legislation to protect itself from alien plant pests. Nonetheless, the original law, its amendments, and related legislation now constitute one of the most flexible and comprehensive sets of laws dealing with this problem.

The Plant Quarantine Act which regulates the importation and interstate movement of potential pest-carrying material became law August 20, 1912 (37 Stat. 315). Its enactment culminated many years of effort by entomologists and others who fully appreciated the plant-pest problem.

Amendments to the 1912 Act

An appropriation act of March 4, 1917 (39 Stat. 1134, 1165) amended the 1912 Act, giving the Secretary of Agriculture authority to impose a domestic quarantine without actually determining that plant pests infest the area involved. These broader powers were needed to deal with white-pine blister rust, citrus canker, and other pests, the actual spread of which cannot always be accurately determined. The same act also authorized the Secretary of Agriculture to quarantine and regulate the interstate movement of articles other than plants and plant products.

An appropriation act of May 31, 1920 (41 Stat. 694, 726) further amended the 1912 Act by giving the Secretary of Agriculture authority to conduct pest-control activities within the District of Columbia.

Another amendment to the 1912 Act (44 Stat. 240, approved April 13, 1926) was occasioned by a decision of the U.S. Supreme Court. It restored to the States authority to quarantine against movements into or through their territories to prevent the spread of plant pests not covered by a Federal quarantine.

An act of May 1, 1928 (45 Stat. 468) further amended the 1912 Act. This amendment gives plant pest control personnel authority to stop and, without a warrant, to inspect, search, and examine any vehicle, boat, or receptacle moving interstate, when there is reasonable certainty that such conveyances contain prohibited or restricted articles. These articles may be seized, destroyed, or otherwise disposed of. The need for this amendment was acutely felt by those attempting to enforce quarantines against the European corn borer, Japanese beetle, pink bollworm, and white-pine blister rust.

Other Acts Affecting Domestic Quarantines

On March 4, 1915, Congress enacted the Terminal Inspection Act (38 Stat. 1113). This act provides for individual States to inspect plants and plant products mailed to points within their boundaries as the final destination. It enables States to exclude plant materials mailed in violation of a plant quarantine law or regulation of the State. States can also exclude plant materials mailed in violation of a Federal plant quarantine or plant materials found to be infested with injurious pests.

A section of the Department of Agriculture Organic Act of 1944 (58 Stat. 735) authorizes the Federal Government to cooperate with States to control, suppress, and prevent the spread of specific pests. A 1957 amendment expanded this authority to include all insect pests, plant diseases, and nematodes. This authority has improved pest control and quarantine effectiveness.

The Federal Plant Pest Act, which superseded the Insect Pest Act of 1905, became law May 23, 1957. It closed many of the remaining loopholes in plant quarantine authority. It broadened the definition of a plant pest to include any known organism that can directly or indirectly injure a plant. It also includes as pest carriers any product or article of any character whatsoever, or means of conveyance. Other provisions give authority for emergency action and make it possible to issue regulations necessary to prevent pests from spreading.

